

June 11, 2003

## Profiler Wind BUFR message format

Wind profilers are evolving, and so are the methods of processing the data from them. Our goal is a flexible format that will encompass vertical upper air profiles regardless of the type of instrumentation used to measure them, enabling future data processing systems to operate with a minimum of software development.

Also, in order to avoid time delays encountered due to data organization, we propose a single station's measurements for a single time period in each individual message. Our single most heard complaint about current data delivery is that it isn't as timely as could be, especially for use in NWP.

This message format is a subset of the COST 76 standard BUFR message format for the interchange of wind profiler and RASS data between member states, 1995, and of current BUFR encoded message formats delivered to NWS.

BUFR Message Sub-Type field in Section 1 is used to indicate the originating station type:

0 = NOAA profiler network stations

1 = Cooperating Agency Stations

Proposed BUFR definition for Profiler Winds:

<b>Data Field</b>	<b>Element Name</b>	<b>Table B Descrip</b>	<b>Scale (10**n)</b>	<b>Reference (-n)</b>	<b>Width (Bits)</b>	<b>Units</b>	<b>Comments</b>
1	WMO Block #	0 01 001	0	0	7	Numeric	(3 1 32) (3 1 1) MBM
2	WMO Station #	0 01 002	0	0	10	Numeric	(3 1 32)(3 1 1) MBM
3	Type of Station	0 02 001	0	0	2	Code Table	(3 1 32) 0 = automatic
4	Year	0 04 001	0	0	12	Year	(3 1 32) (3 1 11)
5	Month	0 04 002	0	0	4	Month	(3 1 32) (3 1 11)
6	Day	0 04 003	0	0	6	Day	(3 1 32) (3 1 11)
7	Hour	0 04 004	0	0	5	Hour	(3 1 32) (3 1 12)
8	Minute	0 04 005	0	0	6	Minute	(3 1 32) (3 1 12)
9	Latitude (Low Accuracy)	0 05 002	2	-9000	15	Degrees	(3 1 32)(3 1 24)
10	Longitude (Low Accuracy)	0 06 002	2	-18000	16	Degrees	(3 1 32)(3 1 24)
11	Height of Station	0 07 001	0	-400	15	M	(3 1 32)(3 1 24)Elevation AS
12	Station short name	0 01 018			40	CCITT IA5	MBM
13	Type of measuring equip	0 02 003	0	0	4	Code Table	6 = wind profiler
14	Change data width	2 01 132					4 bits added
15	Change data scale	2 02 130					10**2 scaling added
16	Mean frequency	0 02 121	-6	0	11	Hz	Profiler mean freq
17	Unchange scale	2 02 000					
18	Unchange width	2 01 000					
19	Time Significance	0 08 021	0	0	5		2 = Time Averaged
20	Averaging Time Period	0 04 026	0	-4096	13	Seconds	-360 or -3600 for NPN (note
21	Repeat 9 descriptors	1 09 000					
22	Replication number	0 31 001	0	0	8	Numeric	# of wind measurements
23	Height above station	0 07 006	0	-1000	17	Meters	
24	Quality Indicators	0 25 034	0	0	4	Flag Table	
25	Wind Direction	0 11 001	0	0	9	Degree True	
26	Wind Speed	0 11 002	1	0	12	m.s <sup>-1</sup>	
27	Change data width	2 01 127					
28	Horizontal std dev.	0 11 050	1	0	11	m.s <sup>-1</sup>	
29	Unchange data width	2 01 000					
30	Vertical component	0 11 006	2	-4096	12	m.s <sup>-1</sup>	
31	Vertical std dev.	0 11 051	1	0	8	m.s <sup>-1</sup>	

Total section 4 length for 1 profiler =  $131 + 66 * 50 = 3431$  bits = 429 bytes

Legend: MBM = May Be Missing

Note 1: I believe this number should be negative to denote the fact we were averaging over the PREVIOUS n seconds.

Contact: Alan E. Pihlak ([Alan.E.Pihlak@noaa.gov](mailto:Alan.E.Pihlak@noaa.gov))